

Rec'd PAT/PTO 24 SEP 2004**10/509053**

Support for apparatus in general and, in particular, for optical or photographic apparatus and the like.

Technical field

The subject of the present invention is a support for apparatus in general and, in particular, for optical or photographic apparatus and the like, of the type described in the preamble to the main claim.

Technological background

Supports including the above-mentioned characteristics are used widely in the photographic and cinematographic fields, generally in association with tripods or stands for the orientable support of cameras. In this field, a need arises to position the stand or tripod with a pillar support mounted thereon and to be able to orient the apparatus mounted on the support about its own axis. This need arises typically in so-called panoramic shots.

In this situation, it is necessary to position the tripod with care so that the rotation of the pillar takes place whilst the desired state of levelness of the camera is maintained.

Cinematographic tripods and stands are also known, in which, to avoid the need for levelness, supports are used which have orientable platforms on which the head that supports the optical or photographic apparatus is mounted in turn. However, these supports require rack drives which interfere with the freedom of positioning of the pillar. Moreover, they are wholly unsuitable for applications in which the pillar can be moved to two or more positions on the tripod.

Supports for apparatus having the features outlined in the preamble of the main claim are disclosed in US 3128982 and in US 2168988.

Description of the invention

The main aim of the invention is to provide a support which can be mounted on tripods of conventional design and which at the same time affords all

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of the advantages typical of tripods with orientable platforms.

Within the scope of this aim, an important object of the invention is to provide a support which has safety devices for protecting the integrity of the apparatus that can be mounted on it.

5 Another object of the invention is to provide an easily adjustable support.

One of the chief objects of the invention is to provide a support which is designed structurally and functionally to overcome all of the disadvantages discussed with reference to the prior art mentioned.

— This aim, with these and further objects, are achieved by a support formed
10 in accordance with the appended claims.

Brief description of the drawings

The characteristics and the advantages of the invention will become clearer from the detailed description of a preferred embodiment thereof, described by way of non-limiting example, with reference to the appended
15 drawings, in which:

Figure 1 is a perspective view of a tripod including a support according to the invention, with parts separated,

Figure 2 is a view of the support of Figure 1 in longitudinal section,

Figure 3 is a plan view of the support of Figure 1,

20 Figure 4 is a section through the support, taken on the line IV-IV of Figure 1.

Preferred embodiment of the invention

In the drawings, a tripod for photographic and/or cinematographic uses, generally indicated 1, has legs 2 all of which converge in a spider 3 through
25 which two seats, both indicated 4, extend; the stem 11 of a pillar 12, forming part

of a support, formed in accordance with the invention and generally indicated 10, is housed alternatively in one or other of the seats 4.

The stem 11 has a three-lobed, tubular configuration with an approximately triangular, equilateral shape with rounded angles. One of the
5 angles has a wall thickening 13 which enables the stem to be machined if necessary to produce an optional rack within the thickness of the thickening 13.

The support 10 comprises, at a first end of the stem 11, an orientable platform 14 including a first ball and socket joint with a socket 15 and a ball 16 fixed firmly to the pillar 12 and to a fixing plate 17 of the platform 14, respectively.
10 The socket 15 is fixed to the pillar by means of a shank 18 of the socket, which is housed and clamped in the stem 11. The ball 16 is fixed to the fixing plate 17 by means of screws 19. The plate 17 also carries fixing means 20, 21 for a head T which is orientable about two or more axes, and spirit-level means 22. The means 20 comprise a screw for clamping the head against the plate 17. The
15 means 21 comprise a plurality of grub screws converging towards the axis of the screw and arranged to preload the screw coupling between the fixing plate 17 and the head T of the apparatus A fixed thereto. Accidental slackening of the screw coupling 20 is thus prevented.

The grub screws 21 are inclined to the axis of the screw 20 so as to be
20 accessible even though they are close to the ball 16 and the overall size of the fixing plate 17 is small.

The ball 16 is clamped in the socket 15 in order to lock the first ball and socket joint by means of a tie rod 23 extending axially through the pillar 12 and restrained on the ball 16 by means of a second ball and socket joint 24 including
25 a ball 25 fixed to the end of the tie rod 23 and a spherical seat 26 formed in the

ball 16 of the first joint.

At its end remote from the ball 25, the tie rod 23 has a threaded shank 27 which is engaged by screwing in a female thread 28 formed in a knob 29. A plug 30 is inserted in the end of the stem 11 corresponding to the knob 29 and a self-
5 locking nut 31 is screwed onto the threaded shank 27 to abut the plug 30, with the interposition of a Belleville washer 33. A friction load is thus provided in the first and second ball and socket joints, independently of the slackening or removal of the knob 29 from the shank 27, that is, when the tie rod is slackened, so as to secure the photographic apparatus A mounted on the orientable
10 platform against abrupt oscillations and impacts resulting from such slackening.

A small plate 34 interposed between the knob 29 and the pillar 12, is fixed firmly to the knob and projects radially therefrom to interfere with the spider 3, to prevent the pillar accidentally slipping out of the seat 4.

The sliding of the pillar in the seat 4 can be stopped in an adjustable
15 position by means of a brake 35, for example, of the type with a screw-operated block mounted on the spider 3 and operable by means of a hand wheel, or by means of the devices provided for in the Applicant's Italian patent application No. PD98A000096.

In order to clamp the orientable head T, for example, a panoramic head,
20 on the support 10, or to clamp an optical, photographic, or cinematographic apparatus such as the video camera A directly on the support, the camera is positioned on the fixing plate 17 and is fixed thereon as indicated, by the means 20, 21. The orientable platform is then levelled by slackening the knob 29, and with it the tie rod 23, as much as necessary in order to pivot the socket and ball
25 15, 16 of the first ball and socket joint relative to one another. Should the tie rod

be slackened too much, the maintenance of a friction preloading by the nut 31 and by the Belleville washer 33 prevents sudden pivoting of the orientable platform and consequent damage to the apparatus A supported thereon. Upon completion of the desired levelling, which can be achieved by virtue of the spirit-level means 22, the knob 29 is tightened in order to lock the first ball and socket joint in the position reached.

It is pointed out that, by virtue of the shape of the stem 11 and of the seat 4, which provide for a non-rotatable, guided coupling of the pillar in the spider, the levelling of the orientable platform is maintained, even if the height position of the support relative to the tripod is varied.

The desired height adjustment is thus performed in the knowledge that the levelling achieved will be maintained for any subsequent rotation of the apparatus by means of its support head.

In order to remove the support 10 from the tripod, it suffices to slacken the knob 26 completely until it is removed from the threaded shank 27 of the tie rod 23, together with the small plate 34, and then to release the block brake disposed in the spider 3.

The invention thus achieves the aim proposed and affords many advantages over conventional supports. By producing the support in a form such that it is removable from the tripod, the tripod can be used in different combinations and in different positions.

Moreover, the prevention of relative rotation between the pillar and the spider achieves the advantage mentioned above, that the levelling of the platform is maintained irrespective of the movement of the pillar relative to the spider.

The provision of a friction load on the first ball and socket joint constitutes

a precautionary measure for protecting the support and whatever is mounted on it.

The provision of thickenings in the stem permits optional machining thereof for a rack drive.